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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-----------------------|---------------------|------------------|
| 09/574,707 | 05/18/2000 | Branislav A. Petrovic | 43849-5 | 9242 |

7590 06/13/2005

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EXAMINER

STEIN, JULIE E

| ART UNIT | PAPER NUMBER |
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2685

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|------------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/574,707 | PETROVIC, BRANISLAV A. | |
| | Examiner | Art Unit | |
| | Julie E. Stein, Esq. | 2685 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6-11-05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-16 is/are allowed.
- 6) ☒ Claim(s) 1-9, 11 and 17 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 January 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on January 11, 2005. These drawings are acceptable.
2. However, the drawings are objected to because element t^2 should be labeled Vt^2 in Figure 11A. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The substitute specification has been accepted.

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4. However, the disclosure is objected to because of the following informalities: on page 31, line 25, both 230 and 222 are deleted. The Examiner believes that 222 should be added back in.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9, 11, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,771,941 B2 to Kim in view of U.S. Patent No. 5,457,811 to Lemson.

Kim teaches all the steps of independent claim 1, including a method of up-converting a modulated IF signal to an assigned one of a plurality of RF channels (column 1, lines 14 to 22), each of the channels comprising a channel frequency band (column 3, lines 45 to 48), said method comprising, amplifying the power level of the IF signal with a gain (Figure 2, elements 34), mixing the IF signal with a local oscillator circuit (Figure 2, element, 38) to produce an RF output signal (column 1, line 16) falling within the channel frequency range of the assigned RF channel (column 3, lines 45 to 48).

However, Kim does not teach attenuating the RF output signal by a factor substantially equal to said gain by adjusting said power level of said IF signal and a level of said RF output signal to produce a desired trade-off between a signal-to-noise

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ratio and a signal-to-distortion ratio of said RF output signal while maintaining a desired constant level of said RF output signal. But, Lemson teaches in Figure 2, the use of first and second variable programmable attenuators 32 and 34. See column 16, lines 29 to 50. In one embodiment of Lemson, the attenuators are set in an opposite manner, therefore the overall system gain remains constant regardless of the power level detected. See, column 16, lines 50 to 63. In addition Lemson teaches that the signal to noise ratio S/N and distortion characteristics are to be taken into account in regards to the gain of the system. See column 18, lines 29 to 64.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify the up converter of Kim to incorporate the teachings of Lemson, including that the attenuators be set in an equal and opposite manner because this takes into consideration the S/N and distortion characteristics within the system. See, Lemson, column 16, lines 50 to 63, and column 18, lines 29 to 64.

The rejection of independent claim 1 is hereby incorporated. Kim in view of Lemson teach all the steps of independent claim 4, including a method of optimizing frequency conversion (Kim, column 1, lines 14 to 22), comprising, receiving an input signal having a first frequency (Kim, Figure 2, elements 34), controlling a level of said input signal (Id.), receiving a local oscillator signal having a second frequency (Kim, Figure 2, element, 38), converting said first frequency into a third frequency by mixing said input signal with said local oscillator signal to generate an output signal having said third frequency (Id.), controlling a level of said output signal (Kim, Figure 2, element 40),

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and adjusting said level of said input signal and said level of said output signal to produce a desired trade-off between a signal-to-noise ratio and a signal-to-distortion ratio of said output signal while maintaining a desired constant level of said output signal (see Lemson reasoning above).

The rejection of independent claims 1 and 4 are hereby incorporated. Kim in view of Lemson teach all the steps of independent claim 5 and dependent claim 6, including those identified above and tuning said third frequency of said output signal to one frequency value selected from a set of desired frequency values by tuning said second frequency of said local oscillator signal to a corresponding frequency value. See Kim, column 4, lines 42 to 45, which teaches that the local oscillator generates a single frequency signal.

Kim in view of Lemson further teach determining a desired trade-off between a signal to noise ratio and a signal to distortion ratio of said output signal for each one of said set of desired frequency values, and achieving said desired trade-off between the signal-to-noise ratio and the signal-to-distortion ratio of said output signal for each one of said frequency values of said output signal by controlling said input signal level and said output signal level while maintaining a desired constant level of said output signal. See Lemson, reasoning above.

In addition, as recited in claim 6, the method further includes a frequency down-conversion of a modulated input IF signal to an assigned one of a plurality of RF output channels. See, Kim, Figure 2.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to repeat the steps of claims 1 and 4 in order to achieve the desired trade-off for multiple frequencies as claimed in claim 5.

The rejections of claims 1, 4, and 5 are hereby incorporated. Kim in view of Lemson teach all the elements of independent claim 11, including a frequency converter device (Kim, Figure 2), comprising a first signal input (Kim, Figure 2, element 31), a first controller (Kim, Figure 2, element 33), a second signal input (Kim, Figure 2, element 38), a converter (Kim, Figure 2, element 36), a second controller (Kim, Figure 2, element 40), a filter (Kim, Figure 2, element 44), and an amplifier (Kim, Figure 2, elements 33, 34, 40, and Lemson column 16, lines 50 to 63, and column 18, lines 29 to 64.

The rejections of claims 1, 4, 5, and 11 are hereby incorporated. Kim in view of Lemson teach all the elements of independent claim 17, including, a frequency converter device (Kim, Figure 2), comprising a first signal input (Kim, Figure 2, 31), a first controller (Kim, Figure 2, 33), a second signal input (Kim, Figure 2, 38), a first converter (Kim, Figure 2, 36), a second controller (Kim, Figure 2, 40), a second converter (Kim, Figure 2, 40 and 41), and a third controller (Kim, Figure 2, and Lemson column 16, lines 50 to 63, and column 18, lines 29 to 64.

Kim in view of Lemson teach all the steps of dependent claims 2 and 7, including filtering one or more distortion components from the RF output signal. See Figure 2, elements 39, and 44.

Kim in view of Lemson teach all the steps of dependent claim 3, including wherein the gain is nominal whenever at least one of the one or more distortion components cannot be filtered. It would have been obvious to one of ordinary skill in the art at the time the invention was made, to understand that if the desired trade-offs were not available due to the distortion being unable to be filtered, then one of ordinary skill in the art would understand that the gain would be nominal.

Kim in view of Lemson teach all the steps of dependent claim 8, including wherein said achieving further comprises, maintaining a constant desired output RF signal level by adjusting said assigned one of said plurality of output RF channels while increasing a level of said modulated input IF signal by adjusting said level of said modulated IF input level to an extent not exceeding specification requirements set for said signal-to-distortion ratio of said output RF signal. See Lemson, column 18, lines 53 to 64.

Kim in view of Lemson teach all the steps of dependent claim 9, including wherein said maintaining further comprises, combining variable attenuation, and variable or fixed amplification of each of said IF signal and RF channel. See, Kim, Figure 2.

Allowable Subject Matter

6. Claims 12-16 are allowed.
7. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or suggest a method combining the steps of optimizing frequency conversion for generating a broadband composite signal, where a plurality of modulation signals is assigned to a each of a plurality of RF channels,

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converting the frequencies, mixing the plurality of modulation signals, amplifying, mixing the amplified signal, attenuating, and finally summing the converted outputs.

8. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or suggest the use of optimizing exchange rate coefficients on a channel by channel basis and programming said coefficients in non-volatile memory utilizing a controller.

Response to Amendment

10. All amendments have been entered.

11. In view of the claim amendments, the claims objections have been withdrawn.

12. In view of the substitute specification, the previous objections of the first office action dated October 12, 2004, to the specification have been withdrawn.

13. In view of the replacement drawing sheets, the previous objections of the first office action dated October 12, 2004, to the drawings have been withdrawn.

Response to Arguments

14. Applicant's arguments with respect to claims 1-3 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie E. Stein, Esq. whose telephone number is (571) 272-7897. The examiner can normally be reached on M-F (8:30 am-5:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JES

Nguyen
6-8-2005

**NGUYENT.VO
PRIMARY EXAMINER**